

PANGRAM VARIATIONS

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Pangrams -- sentences in which each letter of the alphabet is used exactly once -- have been around for many years. Although a definitive article on their history has never, to my knowledge, been written, attempts to create pangrams go back at least a century. In A Budget of Paradoxes (Dover reprint, 1954), the famous English mathematician Augustus De Morgan mentions that he and William Whewell once amused themselves by trying to construct a pangram. I, QUARTZ PYX, WHO FLING MUCK BEDS, the best they could come up with, is a 26-letter sentence in which an extra I and U are substituted for J and V (in ancient inscriptions, these letters were interchangeable). Unfortunately, pangrams often require a good bit of explanation before their meaning is clear to the uninitiated. De Morgan's comments are typical:

I long thought that no human being could say this under any circumstances. At last I happened to be reading a religious writer -- as he thought himself -- who threw aspersions on his opponents thick and threefold. Heyday! came into my head, this fellow flings muck beds; he must be a quartz pyx. And then I remembered that a pyx is a sacred vessel, and quartz is a hard stone, as hard as the heart of a religious foe-cursor. So that the line is the motto of the ferocious sectarian, who turns his religious vessels into mud-holders, for the benefit of those who will not see what he sees.

One way out of this obscurity is to allow some letters to be used more than once. It is surprising how few additional letters are needed; here is a sampling of the best ones of various lengths:

WALTZ, NYMPH, FOR QUICK JIGS VEX BUD (28)
HOW QUICKLY DAFT JUMPING ZEBRAS VEX (30)
JACKDAWS LOVE MY BIG SPHINX OF QUARTZ (31)
PACK MY BOX WITH FIVE DOZEN LIQUOR JUGS (32)

The jackdaws pangram is cited in the Guinness Book of World Records without attribution; Marvin Moore of Estacada, Oregon claims to have originated it (Oregon Journal, July 8, 1968).

Pangrammatic research has been hampered by the requirement that reasonable sentences be formed. One can define a whole constellation of interesting investigations if one concentrates on the words making up a pangram without insisting that they have a collective meaning.

First it is necessary to define the stockpile of words out of which pangrams can be formed. To fix ideas, we allow only those words appearing in boldface type in the Merriam-Webster Pocket Dictionary, or readily inferred forms (noun plurals and verb endings in -S, -ED or -ING). Other than I and A, we do not allow single letters of the alphabet to be regarded as words; similarly, we disallow prefixes, suffixes, and words that appear only as part of multi-word phrases.

What is the smallest number of words into which the letters of the alphabet can be anagrammed? The answer is a bit unexpected: there is no collection of Pocket Webster words that can be formed in this manner. The nearest approach is 25 letters, as illustrated by CHINTZ PLUMBS FJORD GAWKY VEX. Nevertheless, the failure to achieve perfection suggests a new avenue of inquiry; what is the largest number of different letters of the alphabet, each used once, that can be anagrammed into four words? three words? two words? one word? The final question can be rephrased in a more familiar form: what is the longest isogram in Webster's Pocket Dictionary? In short, isograms and pangrams are the limiting cases of a series of challenging word-problems which have not been previously explored.

The longest isogram in the Pocket Dictionary is well-known: the 14-letter AMBIDEXTROUSLY. It is unlikely that two words can utilize more than 19 letters, as illustrated by BLACKSMITH GUNPOWDER. The three-word record is presently 22, as exemplified by HUMPBLOCKS FROWZY TINGLED, and the four-word record of 24 is given by HUMPBLOCKS FROWZY VELDT JINX. Other combinations of words can be found which achieve these letter-scores.

Let us now eliminate the requirement that each letter of the alphabet can be used only once, and ask how many different letters of the alphabet can be used in one, two, three, ... words. We expect to do somewhat better than the 14, 19, 22, ... different letters established above. However, we are surprised once more; the improvement is modest or non-existent. To begin with, there does not appear to be any word in the Pocket Dictionary which uses 15 (or more) different letters; no doubt this is a consequence of the relatively small number of words of 16 or more letters. For two words, a one-letter improvement is possible: AMBIDEXTROUSLY WATCHMAKING uses 20 different letters. For three words, the best set may be the 23-letter AMBIDEXTROUSLY FOREKNOWLEDGE RECEIVERSHIP, again a one-letter improvement.

If four or more words are allowed, it is possible to use all 26 letters of the alphabet, and the criterion of excellence must be changed from the number of different letters used to the minimum number of total letters used. The four-word record of 39 letters seems amenable to improvement: ZIPPING FOXHOUND JABBERWOCKY VENTRILOQUISM. The five-word record of 29 letters is somewhat more secure: PLUMBING CHINTZY SQUAWK FJORD VEX. If six words are allowed, the absolute minimum of 27 letters is reached: LAMB SQUAWK FJORD CHINTZ VEX GYP.

What are the analogous results if a larger dictionary is used? We enlarge the stockpile of words to include the Second and Third Editions of Webster's Unabridged, while retaining the various restrictions introduced earlier. Unfortunately, there is no easy way to locate groups of words having the required properties; therefore, many of the results below must be regarded as preliminary, subject to improvement by the diligent dictionary-searcher.

To begin with, it is now possible to find a set of words which exhausts the alphabet; Dmitri Borgmann has come up with the five-word PHLEGMS FYRD WUZ QVINT JACKBOX.

The longest isogram in Webster's is generally recognized to be the 15-letter DERMATOGLYPHICS, an improvement of only one letter over the Pocket Dictionary entry. The two words BLACKSMITH GUNPOWDERY utilize 20 letters, again only a one-letter gain. One can speculate on the possibility of finding three words which use 23 letters, or four words which use 25, but it has proved impossible to find any examples.

If letters can be used more than once, there are a handful of Websterian words which use 16 different letters, the shortest of which appears to be SUPERACKNOWLEDGMENT. Ralph Beaman proposes FORMALDEHYDESULPHOXYLIC VENTRILOQUIZING as a two-word combination having 22 different letters which should be difficult to beat; however, a pair of words using fewer total letters might be found.

When three or four words are allowed, all 26 letters can be included. This problem was first investigated in the May and August 1972 Kickshaws; Mary Youngquist proposed the four-word 31-letter set JACKBOX VIEWFINDERS PHLEGMY QUARTZ, and Darryl Francis discovered JXTAPYLORIC QUICK-FLOWING SEMIBOLSHEVIZED, a three-word set with 39 letters. Subsequently, he lowered the letter-count to 36 with BENZOXYCAMPHORS QUICK-FLOWING JUVENTUDE.

If open sources are allowed, it is possible to find a set of four words which uses the 26 letters of the alphabet. Dmitri Borgmann suggests FJORDHUNGKVISL (a short river in central Iceland, listed in Volume 3 of the Times Atlas of the World), PECQ (a town in western Belgium, near the French border, also listed in Volume 3 of the Times Atlas), WAMB (an obsolete spelling of womb, in Webster's Second) and ZYXT (an obsolete Kentish second person singular indicative present form of the verb see, the last word in the Oxford English Dictionary).

Dmitri Borgmann has also constructed a set of three words containing the alphabet which uses only 28 letters: FJORDHUNGKVISL, EXPECTABLY, and MQWZ, the last word being a reformed spelling of the word mows using a method developed by Fred S. C. Wingfield a generation ago (see page 288 of H. L. Mencken's The American Language, Supplement II).

It seems virtually impossible to find a set of two words exhausting the alphabet. Dmitri Borgmann has proposed a far-from-satisfactory solution which makes use of the inferred verb form QUASI-COMPLEXING and a 100-letter coined word from James Joyce's Finnegan's Wake:

LUKKEDOERENDUNANDURRASKEWDYLOOSHOOFERMOY-
PORTERTOORYZOOYSPHALNABORTANSPORTHAOKANSK-
ROIDVERJKAPAKKAPUK

This can be found on page 257 of the 1962 Compass Books Edition. Can Word Ways readers locate a better pair?

A pangrammatic crossword (Word Ways, February 1970) can be viewed as a word list containing all the letters of the alphabet, together with a few repeated letters. However, few word lists of this nature can be converted into a pangrammatic crossword; no letter can appear more than twice in the list, and those that do appear twice must be suitably placed so that the words can be interlocked. If the crossword consists of branches without any closed loops (the usual pangrammatic state of affairs), the number of extra letters must be one less than the number of words. From this fact, one can immediately deduce that the least number of words that can appear in a pangrammatic crossword is five; a four-word pangrammatic crossword would require a total of only 29 letters, two less than the record established by Mary Youngquist. Leslie Card of Urbana, Illinois has constructed two five-word pangrammatic crosswords based on Webster's Second or Third Edition:

C		S
H		J
L		W A Q F
W A Q F	J	M
M	V O X	L B V
Y	K	U N C O P Y R I G H T E D
S P I T Z E N B U R G	X K Z	
D		

Still other pangram variations are possible. In the February 1968 Word Ways, it was pointed out that players of the game of Jotto find it useful to construct sets of five-letter isograms with no letters in common. Howard Bergerson came up with a set of five such words from Webster's Second (see below). The Jotto problem can be generalized to words of other lengths: 4 six-letter words and 6 four-letter words, 3 seven-letter words and 7 (or 8) three-letter words:

NTH VEX JUG RIP ADZ SKY FOB (CWM)
CYST FLEX WHIZ JUMP KNOB DRAG
FUDGY JAMBS PHLOX WRECK QVINT
MUZJIK PEGBOX-DWARFS LYNCHT
JACKBOX FRESHLY DUMPING